DOCUMENT RESUME

ED 208 386 CS 006 339

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TITLE Directed Activities Related to Text: Text Analysis and Text Reconstruction.
PUB DATE 81
NOTE 31p.; Paper presented at the Annual Meeting of the International Reading Association (26th, New Orleans, LA, April 27-May 1, 1981).

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Classroom Techniques; *Cloze Procedure; *Content Area Reading; *Critical Reading; *Discourse Analysis; Foreign Countries; Learning Activities; *Reading Comprehension; Reading Instruction; Secondary Education; Teaching Methods
IDENTIFIERS England

ABSTRACT

This paper describes Directed Activities Related to Text (DART), procedures that were developed and are used in the Reading for Learning Project at the University of Nottingham (England) to enhance learning from texts and that fall into two broad categories: (1) text analysis procedures, which require students to engage in some form of analysis of the content or language of a stretch of continuous discourse; and (2) text reconstruction activities, in which the students' tasks are to "reconstruct" texts that have been modified in some way (by the deletion of certain words or by scrambling the order of segments of the discourse). In describing the rationale for both types of reading activity and in explaining the important differences between the two types of procedures, the paper offers examples of texts and text-based activities used with students in secondary schools in England. Transcripts of student discussions of texts are also presented to illustrate how the DARTs work. (RL)

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Paper presented to: 26th Annual Convention of the International Reading Association
New Orleans, 1981

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Directed Activities Related to Text : Text Analysis and Text Reconstruction

by

Florence Davies and Terry Greene

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Directed Activities Related to Text (DARTs) are procedures developed and used by the Nottingham University Reading for Learning Project to further more effective learning from text. They fall into two broad categories. Text analysis procedures require students to engage in some form of analysis of the content or language of a stretch of continuous discourse. In text reconstruction activities the students' task is to 'reconstruct' a text which has been modified in some way; for instance, by the deletion of certain words or by scrambling the order of segments.

This paper begins with a rationale for both types of reading activity; this is followed by an examination of some important differences between the two types of procedure. The comparison will be illustrated with examples of texts and text-based activities used with students in secondary schools[1]. in England. Extracts from transcripts will also be presented. We regret that in illustrating our theme we have to restrict our exemplars to very short stretches of text. Space also restricts us to a limited and superficial sampling of the range of reading activities.

The decision to use exemplars rather than statistics to illustrate the rationale and practical reality of the work is deliberate. Some objective data about the use of DARTs are presented in the next paper. It is our intention, in this paper, to show why the procedures have been developed and used, how and why we think they work, and also to raise some questions which we are not yet able to answer.

I Rationale

1. Definition of text and text structure

The term text is used by the project to refer to a distinct chunk of print drawn from any source which can stand on its own as a unit of learning. Because the units of learning selected in the classroom vary according to the age and abilities of the students, the teachers' objectives, and the actual content of the text, so the chunks of print vary in size. The texts which are the primary data of the project vary in size from a paragraph to a complete chapter.

The texts vary not only in size but also with respect to significant content and meaning. It is the significant content or meaning as judged by

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1. Grade 6 to 12 schools in the U.S.A.

the teachers and students which is to be learned.

By the significant meaning of the text we mean the integrated ideas or facts which go together to make a whole meaningful stretch of discourse. This integration of ideas is distinguished from non-significant, unrelated ideas and facts of the kind which are tapped by traditional comprehension questions. The notion of integration is inseparable from structure. So we call the significant meaning of the text the meaning or Knowledge structure of the text.

Meaning structure and Surface Structure

The meaning structure of the text is distinguished from the surface structure forms through which it is expressed. Throughout the project we have found it necessary to emphasise this distinction between the meaning structure 'behind' the text, and the words phrases and sentences which represent it on the surface. DART's are designed to lead pupils through the surface structure to the meaning structure of written material.

Meaning structures vary both across and within the text of different disciplines. The question is: how are different meaning structures to be identified objectively, and in what ways do they determine surface structures forms?

For teachers of literature there exists a tradition and a vocabulary for dealing at least partially with such issues. This is not the case in the Sciences and the Humanities. Nor are the vocabulary and methods of literary analysis appropriate for describing meaning structures across texts in the content areas.

Identifying Meaning or Knowledge Structures

We have therefore been committed to developing a method for identifying the different Knowledge structures of expository texts. The method which has evolved, described in detail in Davies, Greene, and Lunzer (1980) 'Reading for Learning in Science' is still crude. Nevertheless it enables us at this stage to identify a distinct set of structures which occur in Science, and also in some Geography texts, and to tentatively identify others which appear in Humanities texts.

The 'Knowledge structures' are defined by the sort of thing the text is about; for instance a 'Process' or a 'Structure' an 'Event' or 'Situation'. For each distinct type of content there are always certain basic constituents or 'Knowledge abstracts' which consistently go together and so give the text its integration or structure. For instances in texts about Structures the Knowledge constituents which consistently co-occur are:

Parts of the structure
Location of the parts
Properties of the parts
Function of the parts.

In an 'Event' or 'Story' structure the basic constituents are:

Actors with Goals and Qualities
Settings with Qualities, Properties
Events and Episodes
and Resolutions of Events.

Reading Activities are designed to lead pupils either directly or indirectly to the basic constituents of the meaning or Knowledge structure of the text.

As a consequence, attention in reading tasks is directed not to specific words, phrases, or sentences, but to the principal constituents of structure, which are realised in surface units that vary both in form and in size, ranging from a single word to several consecutive sentences. Nor is there a preoccupation with vocabulary or terminology. We have predicted that if students utilise knowledge structures, vocabulary and language extension will take care of themselves.

Thus, for teachers, the preparation of a reading activity alway involves a prior analysis of the text. In this analysis reference is made to the knowledge structure of its constituents where these are identifiable, and to other significant features of the text. The particular knowledge or textual features selected for attention in the lesson will be influenced in part by the wider curriculum. Within the project text-based lessons are undertaken in the context of ongoing work in English, studies, the Sciences and the Humanities Text analysis in this context involves evaluation of text organisation as well as identification of content.

The text-based lesson provides students with the opportunity to analyse and evaluate the text too. In order to encourage this a copy of the text is always provided for each student. The text is treated as a set of data or ideas that can be physically manipulated as well as being cognitively transformed. It is marked and annotated; in activities like scrambling, it is re-ordered. It should be added that the authority of the text is continually challenged through the reading activities.

Creating the Conditions for Reading to Learn

All of the procedures known as DARTs are designed to interrupt the automated integrated process known as reading. They all have the effect of getting the reader to pause in his reading and to reflect or regress at critical points in the text.

The rapid identification of strings of words is regarded as only one of the conditions likely to facilitate learning from text. Equally important in the view of the project is the availability of time and resources for checking initial identifications.

That time is required for checking and for integrative processing of initial identifications is widely accepted in research investigations. Under experimental conditions, superior performance is seen to be a function of time released or freed after initial identification. How this time is used, as Stanovich (1980) shows, is still a matter of speculation, largely determined by the model of reading favoured. Nevertheless, it is clear that a number of sources: visual, syntactic and semantic, are potentially available for checking and integration.

Reading for learning, in the view of Lunzer and Gardner (1979) requires time for more extensive pausing than the few milliseconds available under most experimental conditions. That deliberate pausing is a characteristic of competent learners was first shown by Thomas and Augstein (1976). The pausing of skilled readers occurred at critical points in the text. Inexperienced readers by contrast failed to distribute their pauses in accordance with the problems posed by the text.

The procedures are not designed to slow down initial identifications of words or meaning per se but to elicit conscious checking of rapid, and often superficial, interpretations and a deliberate utilisation of all resources available. The objective is to encourage depth of processing and to create the conditions which Lunzer and Gardner, in The Effective Use of Reading, considered essential for learning from text: the opportunity and willingness to pause and to reflect on what is being read.

The question we now address is: 'What is to go on at the breaks in reading which will lead to reflection and to learning'.

Making and testing hypotheses

Following on the work of Neisser (1967), many psychologists stress the role of hypothesis testing as the essential element in learning (cf. Minsky, 1975; Smith, 1975). In one form or another, it is argued that learning involves generating a series of hypotheses, testing these hypotheses both against the data and against an existing schema, then modifying the schema in the light of the new information.

The term 'hypothesis' is used here in the general sense of an informed guess. Both hypothesis and test may be automatic and unconscious, but they may also be conscious and deliberate. One of the first principles underpinning the procedures that we advocate is that to maximise learning, hypothesis-generation and testing must be deliberate, conscious, and shared. We predict that such overt, shared hypothesis-testing will produce effective learning and also learning to learn. Students will be led to mastery of the text they are studying and will also be better equipped to deal with other texts they may encounter.

DARTs are intended to encourage students to utilise higher order schemata where appropriate,and other sources of information as the task demands. Like Marshall and Glock (1979-80), Meyer et al (1980), Kintsch and van Dijk (1978) and Walker and Meyer (1981) we stress the importance of higher order schemata in comprehension processes. In the course of conscious hypothesis testing, however, we predict that learners will make use of those sources of information which are most useful for a particular task.

We find it convenient to assume that all sources of information are simultaneously available as they are in Rumelhart's (1977) interactive model. This enables us to make quite specific predictions, as we subsequently show, about the ways in which particular tasks determine the utilisation of different information sources.

Sharing of Interpretations

We have said that the objective of the text-based lesson is not only to facilitate learning of particular information but to increase students' control of their own learning. In order to achieve these aims, learners are not only given the opportunity to explicate tentative hypotheses, and to test them overtly, but to do this in the company of other learners. The discussion element is an integral part of both analysis and reconstruction DARTs. Students work in pairs or in small groups and are encouraged to share interpretations and to respond to and evaluate feedback.

It is this collaborative situation which creates the climate for the explicit generation and testing of hypotheses. This is not to say that readers cannot and do not employ some of the procedures when working independently - rather that teachers take responsibility for giving pupils practice in these procedures in the classroom.

Gradually transcripts of pupil discussion are providing insights into how the procedures (and our pupils) operate. In the classroom hypotheses are tested in the presence of the text and of other learners. Feedback is evaluated through the explicit articulation of tests and criteria. In this 'public' process learners are exposed to alternative hypotheses and

Group discussion can also facilitate learning indirectly by increasing student motivation. In the small group there is an opportunity for all members to participate actively in decision-making and to take responsibility for decisions. There is also maximum opportunity for each individual to receive attention and for his/her ideas to be accepted. We would add that there is increasing evidence to suggest that the collaborative experience contributes towards the establishment of a more positive attitude to learning in general.

Teachers who value the potential of small group collaboration also act in a collaborative role but take responsibility for directing full-class discussions in the lesson when appropriate. The order and pacing of this teacher intervention is determined both by the nature of the task and by the students' response to the task and the text.

Directing Text-based Lessons: a Comparison of DART's with Teacher-generated questions

In sharp contrast to much traditional and current practice teacher direction of text-based lessons is specific and text-determined rather than general. General direction of reading is reflected in task instructions like 'Read this chapter for a test', or 'Revise what we did on the Aneroid Barometer by reading page 27'. By contrast, direction is specific in instructions like 'Underline all the parts of the text which describe the steps or stages of pulp making', or 'Mark all the evidence in the text which shows how Paul Morrell himself felt about his father'.

However, the specific directions which characterize DART's lessons rarely take the form of teacher-generated questions as in traditional comprehension exercises. They contrast with such comprehension questions in several important ways. First, the specific directions are based on meaning structure rather than being fragmented. That is to say they are designed to draw attention to constituents of meaning or Knowledge operating across the text as a whole. It follows that they are determined by a prior analysis of textual structure. By contrast, teacher-generated questions are fragmented either because they are not determined by meaning structure and/or because they have limited potential to direct pupils to that structure. Questions formulated

according to the categories of the Barnett taxonomy (see Clymer 1972) are not determined by meaning structure, since they are behaviourally based - i.e. designed to elicit certain types of student response.

Secondly, the question form tightly controls the nature of pupil response. The use of the question form generally demands that the response, too, be couched in the conventional linguistic form, namely the'answer'. This constraint often operates in such a way as to restrict students to a selection of text items which fit the linguistic convention. By contrast, the specific directions used in DART's do not restrict learners to any conventional linguistic form of reply but encourage them to penetrate, make use of the varying surface structure units which represent meaning. They provide a framework for interpreting the text but allow the student to use his initiative in filling this frame.

Thirdly, teacher-generated questions limited opportunities for explicit testing of hypotheses and even less opportunity for the evaluation of feedback. They provide no support in categorizing the data in the text and they fail to reveal the relations that operate across the text as a whole.

The question form has the effect of either narrowing the focus of reading when it is literal, or else of leaving the reading undirected by requiring inference without indicating where the information required to make the inference may be located. Literal questions like 'Who were the two main characters?' or 'Where did the battle take place?' give the reader nowhere else to go <u>after</u> answering the question. Inferential questions like 'What effect did the location of battle, and the qualities of the two main characters, have on the eventual outcome?' do not indicate to the student where he is to go in the text <u>before</u> answering the question. The essential relations between the who's and where's, their locations and qualities are obscured by the question form. Furthermore the specificity of the question discourages the reader from generating his own questions - those questions which are fundamental to the interpretation of text, and to active learning.

By contrast, instructions for text analysis and text reconstruction activities are designed both to encourage students to generate their own questions, and to work towards an interpretation of the text as a whole. They do this either by getting the student to locate and categorize the significant information in the text or else by getting him to examine relations that operate over the text as a whole. Analysis DARTs do the former; reconstruction DARTs do the latter.

II. Specific Reading Activities

A list of the principal procedures, several of which may be used in any one lesson, is presented in Table I.

Two major variables in constructing DARTs are indicated in the format of the table. Task difficulty is indicated by the position of the procedure on the top-to-bottom dimension. By task difficulty we mean the relative degree of support available to the student from the text or the teacher. It should be emphasised that task difficulty is not a sufficient indicator of the load on the student as it is modified both by the difficulty of the text itself, and the expertise of the learner. Type of reading activity (analysis or reconstruction) is indicated by the allocation of tasks to the appropriate column.

In describing the operation of DARTs, we must restrict ourselves to a single example. We will illustrate the method by comparing an analysis task with the use of teacher-generated questions. At the same time we will establish an initial difference between text analysis and text reconstruction: text analysis makes the learner focus initially on categories, while text reconstruction requires him to focus initially on relations. However, the two activities should not be considered as mutually exclusive.

The extract below, 'Teeth', is taken from a passage which was presented to pupils along with a copy of the diagram of a tooth, showing what teeth are made of, their parts or components, and the properties and functions of those parts. It is a fairly straightforward extract, not rich in nuances of meaning nor intellectually challenging with respect to theoretical content. Nevertheless as a description of a STRUCTURE it is typical of a great deal of textual material in the Sciences and Humanities, the content of which our students are required to comprehend and to learn. It is a text which requires close scrutiny, if the content is to be learned. Specifically it requires the reader to break at each reference to a part, property or function.

TABLE 1 Classification of Directed Activities Related to Text

ANALYSIS DARTS (Straight text)

Pupil Task - Text Marking and Labelling

1. Underlining
   Search for specified targets in text which relate to one aspect of the content.
2. Labelling
   Pupil labelling of segments of text (e.g. paragraphs) which deal with different aspects of text with labels provided by teachers.
3. Segmenting
   (i) Segmenting of paragraphs or text into information units.
   (ii) Labelling of segments of text without labels provided by teacher; producing classification for segments of text

Pupil Task - Recording

4. Diagrammatic Representation
   Constructing diagrams of content of text making a choice from
   Flow diagrams,
   Hierarchies, Networks, or
   Models, Continua
5. Tabular Representation
   Pupil construction of Tables from information given in text.
6. Questions
   (i) Pupils study text to decide how questions would be answered.
   (ii) Pupils generate questions after studying text.
7. Summary
   Summary of information utilising Headings and/or diagrammatic representation.

RECONSTRUCTION DARTS (Modified text)

Pupil Task - Completion Activities with Deleted Text

1. Text Completion
   (i) Pupil prediction of deleted words
   (ii) Pupil prediction of deleted phrases, clauses or sentences
   (iii) Pupil prediction of labels of parts of text where these are deleted.
2. Diagram Completion
   Pupil prediction of deleted labels and/or parts of diagrams using text and diagrams as sources of information. (See Diagrammatic Representation.)
3. Table Completion
   Completion of tables with words or phrases deleted using table categories and text as sources of reference.
4. Completion Activities with Disordered Text
   (i) Predicting logical order or time sequence of segments of text
   (ii) Classifying segments according to categories given by teacher.
5. Prediction
   Pupil prediction of next part(s) of text with segments presented in sequence.

Tooth Structure

Teeth are derived from the skin rather than from bone, but they do contain a high proportion of non-living material.

A tooth has three regions: the crown is the part projecting above the gum, the neck is embedded in the soft gum and the root is out of sight anchoring the tooth in its bony socket. Inside the tooth is a fairly hard material which contains some living cells, this is the dentine. The dentine cannot withstand wear, so in the crown and neck it is covered with a layer of hard, non-living enamel. The dentine in the root is covered with a substance called cement, which helps to fix the tooth in its socket. Inside the dentine, in the centre of the tooth, is a hollow pulp cavity containing nerves, a small artery and a small vein.

If we were to use the question as a means of directing learning we would be obliged to concentrate on the use of literal questions: 'Where is the dentine?' 'What is it covered with?' etc. Answering such questions will not illuminate the text as a whole, because the questions do not provide any framework or theme for student interrogation of the text. At best, we could add the inferential question: 'Which parts of the tooth are made of living material and which are not?' Some information which will allow this question to be answered is available in the text: e.g. 'contains some living cells'; 'hard, non-living enamel'. For the rest, inferences about living/non-living are not possible unless the relevant information is known in advance of reading.

Students engaged in a text analysis activity are directed to the text as a whole from the start. Typical instructions to students working on a text like this would be:

(i) Underline the names of all the parts/materials of teeth.

(ii) Use the text to help you find/locate these parts/materials on the diagram.

(iii) Now mark, in the text, everything which describes each part, and what it does.

Students should now be in a position to construct or complete a table like the one below using the text to help them fill in the cells. It is important to note that there will be empty cells which will indicate where information is missing.

Name of Structure or Part	Location	Property	Function

What is the difference between the questions and the text analysis activity?

First and most important, unless the questions form an ordered list corresponding to the questions 'set' by the cells of the matrix, they direct attention only to isolated and unrelated parts of the text. By contrast the text analysis activity directs attention to the knowledge structure of the text as a whole - the parts, their locations, their properties and functions. Categories (or category names) for analysing the text are provided or elicited in advance.

Evidence that this is what actually does occur in analysis activities is now available from transcripts. The extract shown in Table 2 is from a transcript of a small group of pupils working on the Tooth Structure text and diagram in the presence of a teacher.

The teacher has introduced the lesson and it is agreed that student reading will be directly supported by the STRUCTURE frame. That is, students will first sort out the parts of the tooth, and then 'what they are', 'where they are' and 'what they are used for' (these are the students' terms for PROPERTY, LOCATION and FUNCTION). The objective is to use the information in the text to construct a table.

Table 2 Analysis of discussion transcript - The tooth

P1. Does it tell you what the crown does?

P2. --- protects it ---

P1. Does it say that --

P2. - yes, part protecting above the gum

P1. - it doesn't say protecting does it --

P2. -- Oh, no, projecting

P1. -- does it tell you what the crown does? - doesn't actually does it?

P3. Its the enamel that -- protects it -- look thats the enamel (pointing to diagram) around the crown - cause your crown is enamel isn't it? - thats what they're made of isn't it?

P1. Thats what they're made of - it doesn't tell you what they do

P. - but we know that it protects it doesn't it?

- What?

- --- all that does (pointing to diagram)

- - its used for biting and gnawing though isn't it?

- All that lot (in diagram) is the crown --- so it doesn't actually tell you what its used for - - biting and gnawing --- - but it doesn't say that

- (reading) "The dentine cannot withstand wear, so in the crown and neck it is covered with a layer of hard non-living enamel"

- - they're made of enamel

- -- but it says up there "its -- made from skin" - they're made of enamel -- skin

- -- bone?

- -- No, its derived from skin

- But if we look at this (diagram) - whats it made of?

Sev. Pulp cavity -- dentine - enamel - nerve fibre

Student question	Student hypothesis	Hypothesis tested	Hypothesis rejected	Agreement	Text check	Text omission noted	Procedure check	Property of part	Location of part	Function of part
✓										✓
	✓									✓
				✓						
				✓						
				✓						
				✓						
✓				✓						✓
✓				✓						✓
	✓			✓						
✓	✓	✓					✓			
			✓	✓						✓
✓			✓							
				✓						✓
✓	✓									✓
	✓			✓				✓		
				✓	✓					✓
	✓			✓	✓					✓
		✓			✓					
				✓						
				✓						
	✓						✓			
				✓			✓			
	✓						✓			
✓										
		✓								
✓				✓		✓	✓			
	✓									

Table 2 continued ....

P. Its made of lots of things isn't it?
- Can we sort out what they do and what they're made of?
(Pupils still filling in tables)
T. So you've got enamel, dentine and pulp haven't you, and ---
P. and blood capillary
T. -- the blood and the artery and vein are all in the pulp
P. and what do they all do?
- -- does it tell you what they do?
P. Do they support the crown - no - it doesn't tell what they do
- -- but we know they supply the blood and --
Sev. We know what the root does
- anchors it -
- what is it made of? - its covered with fibres - its in a hole - the fibres are round the outside - its dentine -
P. - dentine - root canal - thats a hole in it - its dentine
P. Dentine again - is that the only thing?
- well look
(diagram) thats the only thing down there.
It doesn't really tell you anything about the neck at all does it? ---
Sev. - its embedded in the soft gum -- its covered in enamel -- holds the crown up - Dentine - is a tissue - what does it say --
-- its made up of living tissue --
- You could put the dentine is in the heart of the tooth

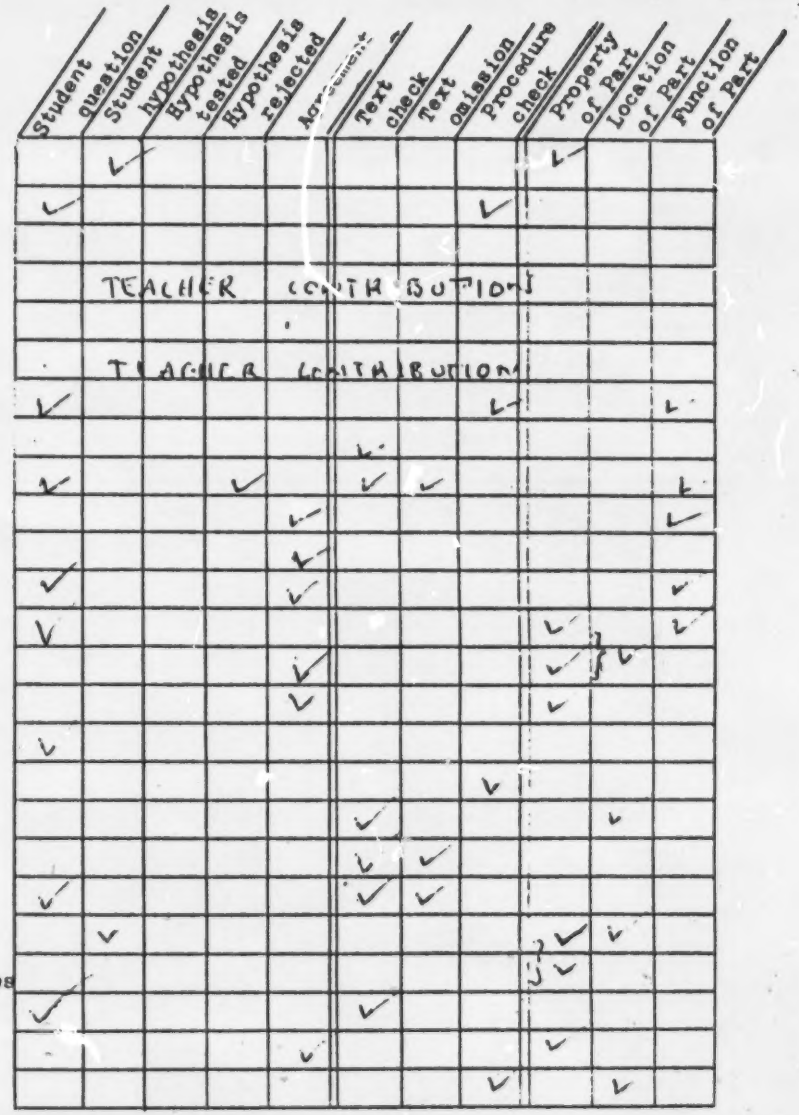


Table 2 continued ....

couldn't you? - Yes, the dentine is the inside of the tooth isn't it?

T. Enamel?

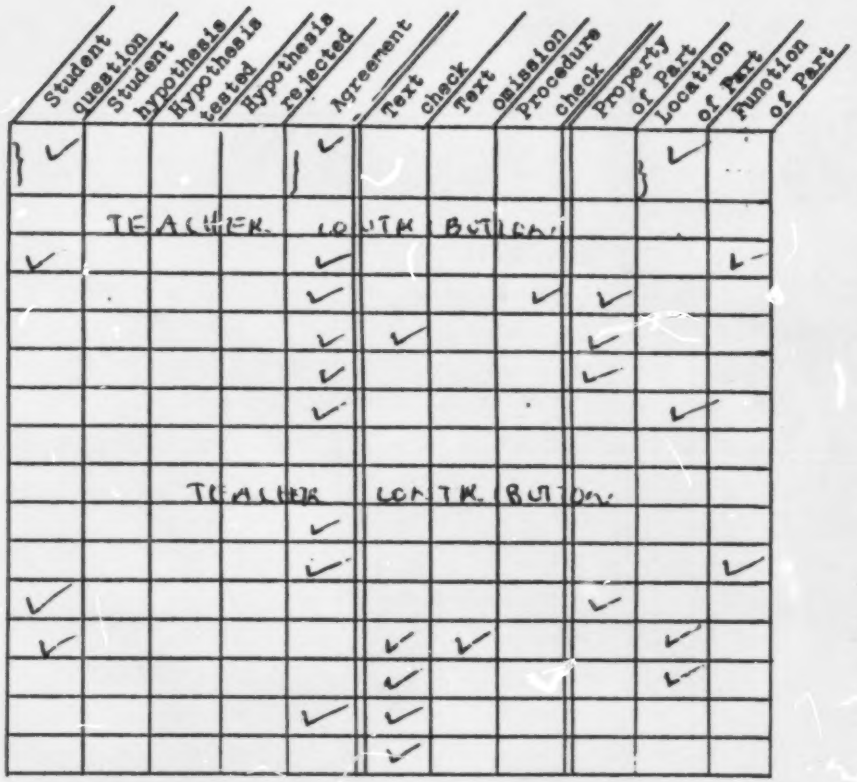
Sev. It protects the neck and the crown - what does it do - protects -- what they are - enamels made of enamel -- -- five lines down - its hard, non-living - all you can say about it is its hard and non-living - - hard is the most important part - where they are - its all over the place

T. Cement?

Sev. Holds it in place -- -- holds the root in place --

P. Whats cement made of?

Sev. - it doesn't say -- where is it? - down the side there (diagram) -- its covering the dentine - holds the root in place -- here it is (diagram) "the dentine in the root is covered with a substance called cement"



We have analysed the transcript using a classification of 'Learning Moves' currently being developed within the project. As a system it is crude and still requires linguistic underpinning, but it is well suited to showing the learning processes which are utilised in text-based lessons, as well as the different styles of learning that characterize different lessons.

In this and other transcripts we wished to examine three things in parallel: (i) the learning moves that students make in order to access text information, (ii) how they explicitly check the text, and (iii) what explicit references are made to the knowledge structure conveyed in the text. These three aspects are portrayed in the three broad columns featured in Table 2.

The transcript, typical of the text-based lessons of the project, provides evidence that students can explicitly control their own learning, that they actively interrogate the text and that they use the relevant knowledge structure to direct their learning. At the same time, even in this short exchange we may discern two distinct patterns both in the distribution of the learning moves and in the utilization of resources. The tentative nature of the initial sequence is clearly indicated by the high frequency of hypothesis-making moves, and the low frequency of hypothesis-testing, and also of acceptance moves. There is also a heavy reliance on the text/diagram as a 'factual' authority. This pattern can be seen to change: as the lesson proceeds, there is more hypothesis-testing and more overt agreement.

We believe that the hypotheses themselves are determined by the text in the first instance (see also Horsfield, 1981). However, if the text and diagram are taken to be 'true', as they must be in this case, then these hypotheses will also be about what the test is actually 'saying', or the structure of the knowledge that it conveys. The role of the Knowledge categories agreed at the beginning of the lesson is therefore critical. It is reflected in the repetition of the questions about "What they're made of", "What it/they does/do" or "is used for", and "where it is", and in the tables produced by pupils.

It is clear that the lesson facilitates learning of specific content. We would predict that the selection of learning moves and the utilization of knowledge structures will also be transferred to the study of other texts. Furthermore the transcript testifies to the high level of motivation provided by student questions, as opposed to teacher-generated questions. None of these is featured in the traditional comprehension lesson.

III Comparison of Analysis and Reconstruction DART's

All DART's provide tasks which lead to pupil-generated questions. Analysis and reconstruction DART's differ, however, in two major respects. These are: direction of entry to the meaning structure of the text and explicit use of categories. In considering these differences, reference will also be made to their mode of operation in the classroom, to the appropriateness of activities for different text types, and to pupil response.

Direction of Entry to Text

Text analysis requires pupils to categorise the information or language of the text. Categories are indicated by the teacher whether or not they are directly named. So we might say that analysis involves a top-to-bottom search of the text. The text-as-a-whole, e.g. STRUCTURE, or PROCESS or STORY provides the framework for analysis. Text references are then allocated to sub-categories, e.g. parts, location, property, function; or alternatively, the focus may be on just one sub-category at a time. Thus analysis DART's provide direct entry to the knowledge structure embodied in the text.

When the task is to reconstruct the text, the student can still be led to access the knowledge structure that it conveys, but the process will now be indirect. Similarly, although both completion and sequencing tasks promote a close analysis of the complete text, the student begins with a study of a specific part.

Nevertheless, it is important to note that both completion and sequencing tasks are used within the project to study the meaning or knowledge structure of the text as a whole. Thus although completion DART's derive from cloze procedure, even single-word completion tasks do not sample the text at random, by deleting every nth word. Instead, items to be deleted are carefully selected by the teacher. The first objective is to focus attention on the relations amongst significant elements of the text. A second objective is to lead students to the text as a whole through a close study of these relations. The students' task is either to fill the gap with a word which 'best fits the meaning of the passage' or to try to work out the word of the original. However, because the student begins his search by focusing on features of individual words, the task is essentially bottom-up.

Explicitness of Categories or Feature-lists

Completion activities may be regarded as identification tasks rather than categorization tasks. Although categories are used by students, the utilization is generally implicit rather than explicit. Thus teachers themselves rarely introduce feature lists for their students to use. Instead the students are encouraged to use a multiplicity of cues or distinctive features to generate a word appropriate for a particular gap. It may be noted, however, that in the process of generating and testing hypotheses the implicit criteria are made more-or-less explicit. This gradual explication of criteria could be regarded as a first step in the construction of a feature list. But the feature list does not provide the framework for analysis. Furthermore the criteria may or may not be relevant to the knowledge structure of the text. For instance, the distinctive features attended to may be linguistic rather than knowledge-based.

All this is in sharp contrast to text analysis tasks. The difference between analysis and reconstruction DARTs is most clearly illustrated by applying the two techniques to the same text. The following text is one of seven extracts which comprise a chapter of a book on history. The reading activities for the extract were designed for experimental purposes with one group of students working analysis darts and the other group using reconstruction (word completion). The choice of extract was made by the history teacher concerned who wanted his pupils to continue their course of study without interruption and to use the basic text book. Thus both sets of reading activities had to be designed to realize aims and objectives consistent with those of the teacher.

> Before the Black Death, going as far back as the twelfth century, many villeins had been freed from their labour services to the lord of the manor. Instead of having to work part of the time on the lord's land they paid him rent for their cottage and strips. With this money the lord hired free labourers to work for wages. Most lords found that wage labourers worked harder than villeins who were always anxious to get back to their own strips.
>
> After the plague, however, workers were scarce. Labourers realised their increased value and demanded more wages than before. Many lords paid up, rather than let their crops rot for lack of hands to gather them in. The same happened in the towns. Masters had to pay higher wages to get enough journeymen to work for them.
>
> Parliament tried to put a stop to these demands. Laws were made ordering that wages should remain as they had been before the plague. Men who travelled in search of higher wages were to be branded on the forehead with a red hot iron!

At the same time Parliament asked for more and more taxes to pay for unsuccessful wars in France. Angrily, working men ignored the laws and tried to avoid the taxes.

Meanwhile, those who were still villeins saw the increased advantages of being free-men, now that wages were rising. So they tried to exchange their labour services for money rents. Some lords agreed, but others refused to give villeins their freedom. They strictly enforced all labour services, and made sure the slackers were fined in the manor court. Villeins became bitter and restless. The adventurous ones gathered their few possessions and fled, with their wives and children. They could easily find work in a town or on another manor. Men were so hard to get that good wages were paid to newcomers and no questions asked about where they came from.

The common people of England, seeing the chance to better themselves, grew discontented with their lords and masters. There were threats of violence against some lords, including a number of abbots and bishops who refused to free their villeins. Because their estates belonged to the Church, many abbots and bishops claimed they should not rent them out or interfere with the old customs in any way. Villeins no longer accepted such excuses. They had lost respect for wealthy, pleasure-loving Church lords. So had many poor priests, who were firmly on the side of the peasants.

From: The Middle Ages by R J Cootes. Published by Longmans Group Ltd. (1972)

The ultimate aim of the two lessons in which the extract was used was to get pupils to reflect upon and to learn the long-term effects of the plague on both peasants and rulers. Thus with both groups the immediate objective was to provide entry to the structural frame of the text.[1]

Group I pupils were asked to locate any part of the text which shows how the workers felt about the changing situation, what they did or what effect it had on them. (The fact that such categories are not necessarily mutually exclusive is a feature of texts which is positively used in the classroom.) Students in group 2 were told that the 'holes' had been made in the text[2] in order to get them to think about the effects of the plague on the peasants and about how the plague played a part in changing the

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1. The passage seems to be one of several that might be categorised as SITUATION. This would feature such constituents as CONDITIONS, EFFECTS, EVENT/INNOVATION NEW CONDITIONS or EFFECTS.

2. Words underlined in this edition were those deleted.

relationship between the peasants and the rulers.

It was predicted that students in Group 1 would search for items that could be categorised in accordance with the theme of the passage. The items located by this group would often be phrases or even whole sentences, and these would be tested for their fit with the three categories 'felt', 'did', and 'how affected'.

Students in Group 2 would search their own lexical store to find individual words to fit a gap in a phrase.

Of the text items underlined by students in the analysis DART, none was a single word. The smallest stretch of text underlined was the three-word phrase "bitter and restless". The majority of items selected were whole sentences, or clauses that realise a complete proposition featuring a predicate and one or more arguments. Notably absent from these units were items realizing the agent slot, no doubt because this category was assumed in the search for effects and conditions (cf. "The common people of England (unmarked) ... grew discontented with their lords and masters.").

Most of the units underlined were pairs of sentences. Where only one sentence was underlined, a break between propositions was frequently marked and labelled: e.g. felt/did in "Labourers realized their increased value/ and demanded more wages than before". We conclude that students in this group were free to ignore the grammatical constraints and concentrate on propositional content.

By contrast, students in Group 2 were forced to examine shorter stretches down to the features of individual words and morphemes. This restriction in utilization of sources is a function of the task. Having to sort the grammatical constraints seems to restrict the learner to the immediate environment which is the sentence. Because it does not encourage a wider search of the text, attention is insufficiently directed to the knowledge embodied in it. The predominating role of syntactic constraints in completion tasks is one which even experienced teachers often fail to anticipate.

What this means is that single word completion is rarely the most effective avenue for learning the essential content of a passage. That is why we find that teachers who have considerable experience in using DARTs are more inclined to delete phrases, clauses and even entire sentences when using text reconstruction.

Reconstruction in Poetry

It is interesting to note that the local constraints which misled the students in the plague extract may well be significant in other contexts.

Thus many English teachers have used word deletion as a means of sensitising pupils either to grammatical conventions or to the potency of particular syntactic patterns in literature. The manner in which these constraints combine to generate an appropriate or obligatory word for the gap is, in one sense, the proper focus of the activity in poetry rather than an intrusion. In the study of poetry, constraints are supplemented by others such as the use of rhyme, rhythm, metaphor and alliteration[1]. As these are the features that hold the poem together, it is usually necessary to go over the poem as a whole, to take advantage of such constraints. Some English teachers who are particularly aware of the potential of deletion (and of sequencing) as tools for the study of poetry, are now making explicit feature lists to help their students when testing the fit of a word or segment of text. Pupils who study poems in this way can often get closer and closer to the original word as they work at the poem, so much so that one is equally impressed by their acumen and their enthusiasm. By way of illustration, one class of pupils was asked to supply the missing words in the following poem:-

Geriatric Ward

Feeding time in the geriatric ward;
I wondered how they found their mouths,
and seeing that not one looked up, inquired
'Do they have souls?'
'If I had a machine-gun', answered the _____,
'I'd show you _____ in death instead of living death.
Death wasn't meant to be kept _____.
But we're under orders
to _____ blood and air in after the _____gone.
I don't understand _____;
I only learned about cells
law abiding as leaves
_____ under frost.
But we, never handing over
to _____ who knows best,
spray _____ with oxygen, _____ for a smile,
count _____ of breathing bags whose direction is _____,
and think we've won.'

Here's a game you can't _____.
One by one they _____ away in the cold.
There's no society forbidding.
_____.

Phoebe Hesketh

1. It should also be recalled that syntactic and even semantic constraints are different in poetic material, inasmuch as the writer is free to bend and transform them (but not dispense with them) in such a way as to achieve maximum effect.

While the possible alternatives for any deletion in a poem may on the surface seem to be wide open, in practice they are few and in many cases, in the view of the pupils, reduce to one. The extract from a transcript of pupils working on "The Geriatric Ward" (Table 3), is an almost classic case of the reduction of uncertainty by rigorous testing of features.

Comparing Table 3 with previous tables, one notes the frequency of explicit testing of hypotheses. Also, although rhyme is used as one of the criteria for completion, most hypotheses and tests are semantic:

- 'how would we react?'
- 'we wouldn't want him to ...'
- 'so how would "fear" fit in there?'
- 'something like "hope"'

Thus, although grammatical fit is a potential source of information in this activity, it is not operating in the restrictive way that it did in the work on the text about the plague.

Concluding Comments

It seems fitting, then, to conclude this paper with some further observations about pupil responses to the two activities.

The readiness of pupils to engage in text completion activities, whatever the text type, is perhaps the most marked characteristic of this type of DART. Completion and sequencing seem to be intrinsically motivating. They have game-like characteristics to which pupils consistently and happily respond. Reconstruction activities put pupils in a position where they have to make some of the decisions originally made by the writer, in a situation where the other constraints governing writing are accessible from the text. It would seem to follow that the quality of pupil writing should improve following a series of such lessons. This hypothesis is currently being investigated.

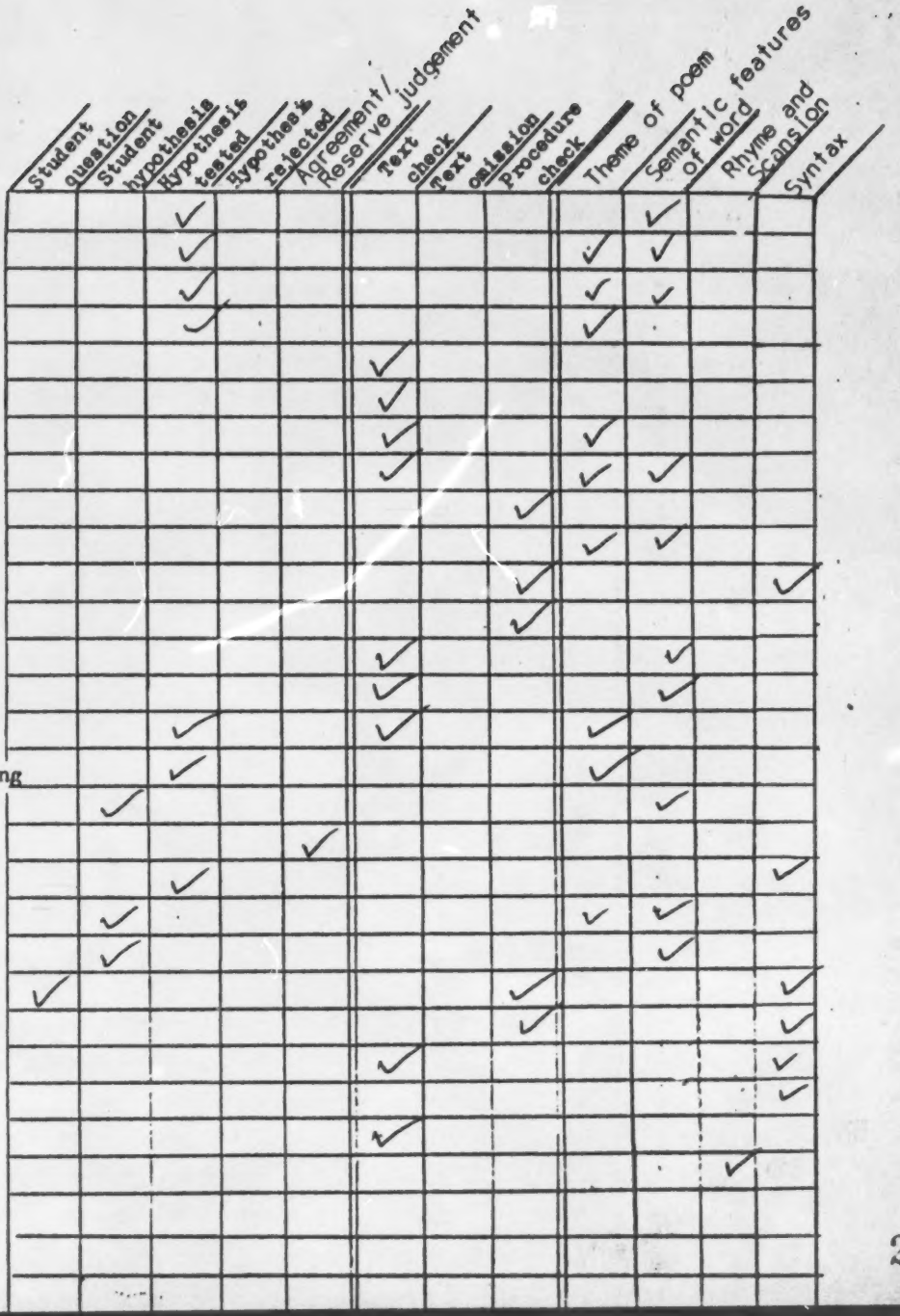
We have tried to show that reconstruction activities also lead to learning, but are more appropriate in some circumstances, with some texts, than is analysis. Similarly, text analysis activities are motivating, but not in quite the same way. Pupils like being able to sort the text out, especially pupils preparing for examination, who take their tasks very seriously. Outcomes in the form of notes or diagrams which reflect the distinctive knowledge structure of the text are regarded as powerful tools for revision purposes.

So text analysis activities have greater potential for transfer to students' independent learning than do most reconstruction activities. We

Table 3 Analysis of discussion transcript - Geriatric ward

	Student question	Student hypothesis	Hypothesis tested	Hypothesis rejected	Agreement Reserve Judgement	Text check	Text omission	Procedure check	Theme of Poem	Semantic features of word	Rhyme and Scansion	Syntax
- I see, so its something to do with the feelings of these old people then					✓				✓			
- How do you think they'd react if the doctor really did walk in with a machine gun?	✓								✓			
- If we were all in there, people just waiting to die		✓							✓			
- and people dying off round the ward		✓							✓			
- and new people being brought in - and for some reason we're still alive, and this bloke walks in with a machine gun and looks as if he's going to broam -- round the room, how would we react?		✓							✓			
		✓							✓			
	✓	✓							✓			
- If we'd been kept alive this long we wouldn't want him to kill us off	✓	✓							✓			
- So how would fear fit in there then?	✓							✓		✓		
- Or perhaps they are -		✓								✓		
- something still keeping these old people going		✓	✓						✓	✓		
- you mean not just the machines	✓								✓	✓		
- people can give up the will to live can't they		✓							✓	✓		
- it might be something like hope		✓								✓		
- something must be keeping them going			✓						✓	✓		
- 'Death wasn't meant to be kept (what)?	✓					✓						
Does it have to fit with that line with 'doctor' on the end?	✓										✓	
- It could be 'secret' -		✓								✓		
- it doesn't necessarily have to rhyme		✓									✓	
- Put secret down - that's a start								✓				
- we might finish up with all kinds of words round there								✓				
								✓				
- can you put 'fear' up there as well		✓								✓		
- and 'hope'		✓								✓		
- I'd like to put 'away' in there		✓								✓		
- 'But we're under orders to (pump) blood and air --						✓			✓			
- Pump, yeh,			✓									
- Any other words we could use for that?	✓							✓				

Table 3 continued ...



- Pump's as good a word as any, isn't it
- Do you actually 'pump' blood in, it drips in --
- I suppose you pump air in though don't you --
- What, those bellows things that keep going up and down
- "After the _____ gone" - ha -
- "I don't understand _____"
- Then it goes on to talk about that -
- after the (life)
- shall we --

  -- after the 'life' has gone

  - shall we stick on 's' on,

  do you think that's cheating
- I don't understand (how)
- I don't understand (life)

  But then he goes to talk about learning

  it's more to do with the whatever it is that's keeping them going
- will
- will, yeh
- then you'd have to make it 'will's' gone -

  - perhaps even spirit or
- fight -
- Can we have two words?
- be easier to do it -
- I don't understand' - I don't understand - (why)

  - (how) - (if)
- 'I only learned about cells law-abiding as leaves
- 'frozen'
- what else can we say about leaves under frost

  withered
- put it in, it might give us an idea for later on --

would hope that all of our students and not just the natural scholars will leave our schools with these tools. To date we have had the collaboration of the students in trying to realize this aim.

There is overwhelming evidence of the readiness of pupils to engage in both text analysis and text reconstruction. Either form of text-based learning results immediately in a focus on the task which is maintained, in a rapidly growing confidence, in a critical approach to text, and in a reduction in problems of classroom management. Students are also benefitting from increased teacher awareness, not of their learning problems, but of their potential for learning.

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The project is indebted to the staff and students of Priory School, Barnsley, South Yorkshire and of Castle Donington School, Leicestershire for their collaboration in the text-based work described.